CLAIMS

What is claimed is:

1.   A method for adjusting a treatment plan comprising:

receiving a treatment plan of a target volume;

receiving a fluoroscopy data image of the target volume; and

adjusting automatically the treatment plan based on movement in the fluoroscopy data

image.

2.   The method of claim 1, wherein the adjusting includes adjusting treatment field

information to allow for movement in a field.

3.   The method of claim 1, wherein the adjusting includes adjusting gating information in the

treatment plan.

4.   A system comprising:

a treatment planning component to generate a treatment plan; and

a simulation component to simulate the execution of the treatment plan on a patient.

5.   The system of claim 4, further comprising:

a verification component to adjust the treatment plan based on the simulated execution of

the treatment plan.

6. The system of claim 4, wherein the treatment plan includes a digitally reconstructive radiograph image.

7. The system of claim 6, wherein the simulation component generates digital fluoroscopy images of the target volume to confirm the digitally reconstructive radiograph image.

8. The system of claim 6, wherein the digitally reconstructive radiograph image is imported into the system.

9. The system of claim 6, further comprising:

a cone-beam computed tomography scanner to generate a digitally reconstructive radiograph image.

10. A gantry, comprising:

a collimator; and

a liquid-crystal display assembly integrated with the collimator to project a plurality of digital outlines onto a patient.

11. The gantry of claim 10, further comprising:

a communications network on which the plurality of digital outlines are received.

12.   The gantry of claim 11, further comprising:

an imager to convert radiation into a digital image of the patient, the imager being

coupled to the gantry; and

a computer workstation coupled to the imager via the communications network, the

workstation to allow a user to contour the digital image to generate the plurality of digital

outlines.

13.   A method of performing brachytherapy comprising:

providing a digital fluoroscopic image of a target volume;

placing a catheter near the target volume based on the fluoroscopic digital image; and

placing a radioactive isotope within the catheter based on the digital fluoroscopic image.

14.   The method of claim 13, further comprising:

receiving a digitally reconstructed radiograph image of the target volume; and

comparing the digitally reconstructed radiograph image to the digital fluoroscopic image

to place the catheter.

15.   The method of claim 13, wherein the fluoroscopic image is produced using a flat panel

imager.

16.   A method of performing brachytherapy comprising:

providing a digital fluoroscopic image of a target volume; and

placing a seed near the target volume based on the fluoroscopic digital image.

17.   The method of claim 16, further comprising:

receiving a digitally reconstructed radiograph image of the target volume; and

comparing the digitally reconstructed radiograph image to the digital fluoroscopic image

to place the seed.

18.   The method of claim 16, wherein the fluoroscopic image is produced using a flat panel

imager.

19.   A method of adjusting a radiotherapy simulator system comprising:

displaying a digital image of a patient based on a treatment plan;

providing input associated with the digital image; and

automatically adjusting one or more components of the radiotherapy simulator system

based on the input associated with the digital image.

20.   The method of claim 19, wherein the components include at least one of a treatment

bench, a radiation source, or an imager.

21.   The method of claim 19, wherein displaying the digital image includes overlaying a

simulator digital image and a digitally reconstructed radiograph image.

22.   The method of claim 21, further comprising:

automatically displaying fields of data based on the digital image.

23.   The method of claim 19, further comprising:

recalculating the treatment plan based on the corrected digital image; and

saving the recalculated treatment plan.

24.   The method of claim 19, wherein the providing input includes providing a radiation field

input.

25.   A method of adjusting a treatment plan comprising:

displaying a digital image of a patient based on the treatment plan;

providing input associated with the digital image; and

automatically adjusting the treatment plan based on the input associated with the digital

image.

26.   The method of claim 25, wherein displaying the digital image includes overlaying a

simulator digital image and a digitally reconstructed radiograph image.

27.   The method of claim 26, further comprising:

automatically displaying fields of data based on the digital image.

28.   The method of claim 25, further comprising:

recalculating a treatment plan based on the corrected digital image; and

saving the recalculated treatment plan.

29.   The method of claim 25, wherein the providing input includes providing a radiation field input.

30.   A gantry, comprising:

a means for projecting a plurality of digital outlines onto a patient, wherein the projected outlines are used to apply one or more reference marks onto the patient; and

a means for communicating, coupled to the means for projecting, the means for communicating to provide the plurality of digital outlines.

31.   The gantry of claim 30, further comprising:

a means for imaging to convert radiation into a digital image of the patient, the means for imaging being coupled to the gantry; and

a means for processing coupled to the means for imaging via the means for communicating, the means for processing to allow a user to contour the digital image to generate the plurality of digital outlines.

32.   A machine-readable medium having instructions to cause a machine to perform a method of adjusting a method of adjusting a radiotherapy simulator system, the method comprising:

displaying a digital image of a patient based on a treatment plan;

providing input associated with the digital image; and

automatically adjusting one or more components of the radiotherapy simulator system based on the input associated with the digital image.

33. The machine-readable medium of claim 32, wherein the components include at least one of a treatment bench, a radiation source, or an imager.

34. The machine-readable medium of claim 32, wherein displaying the digital image includes overlaying a simulator digital image and a digitally reconstructed radiograph image.

35. The machine-readable medium of claim 34, further comprising:

automatically displaying fields of data based on the digital image.

36. The machine-readable medium of claim 32, further comprising:

recalculating the treatment plan based on the corrected digital image; and

saving the recalculated treatment plan.

37. The machine-readable medium of claim 32, wherein the providing input includes providing a radiation field input.

38. A machine-readable medium having instructions to cause a machine to perform a method of adjusting a treatment plan, the method comprising:

displaying a digital image of a patient based on the treatment plan;

providing input associated with the digital image; and

automatically adjusting the treatment plan based on the input associated with the digital image.

39.   The machine-readable medium of claim 38, wherein displaying the digital image includes overlaying a simulator digital image and a digitally reconstructed radiograph image.

40.   The machine-readable medium of claim 38, further comprising:

automatically displaying fields of data based on the digital image.

41.   The machine-readable medium of claim 40, further comprising:

recalculating a treatment plan based on the corrected digital image; and

saving the recalculated treatment plan.

42.   The machine-readable medium of claim 38, wherein the providing input includes providing a radiation field input.

43.   A machine-readable medium having instructions to cause a machine to perform a method for adjusting a treatment plan, the method comprising:

receiving a treatment plan of a target volume;

receiving a fluoroscopy data image of the target volume; and

adjusting automatically the treatment plan based on movement in the fluoroscopy data image.

44.   The machine-readable medium of claim 43, wherein the adjusting includes adjusting field information to allow for movement in the field.

45.   The machine-readable medium of claim 43, wherein the adjusting includes adjusting

gating information in the treatment plan.

46.   A system comprising:

a means for generating a treatment plan; and

a means for simulating the treatment plan on a patient.

47.   The system of claim 46, further comprising:

a means for verifying the treatment plan, the means for verifying the treatment plan to

adjust the treatment plan based on the simulated execution of the treatment plan.

48.   The system of claim 46, wherein the treatment plan includes a digitally reconstructive

radiograph image.

49.   The system of claim 48, wherein the means for simulating generates digital fluoroscopy

images of the target volume to confirm the digitally reconstructive radiograph image.

50.   The system of claim 48, wherein the digitally reconstructive radiograph image is

imported into the system.

51.   The system of claim 48, further comprising:

a cone-beam computed tomography scanner to generate a digitally reconstructive

radiograph image.

52.   A method of performing brachytherapy comprising:

placing a patient on a patient support;

producing an image of the patient using a flat panel imager while on the patient support;

producing a treatment plan for placement of a radiation source while the patient is on the

patient support; and

treating the patient according to the treatment plan on the patient support.

53.   An apparatus comprising:

a means for supporting a patient;

a means for producing an image of the patient using a flat panel imager, the means for

supporting the patient electronically coupled to the means for producing an image; and

a means for computing producing a treatment plan for placement of a radiation source to

the patient, wherein the means for computing further facilitates the treatment of the patient based

on the produced treatment plan, the means for computing electronically coupled to the means for

supporting and the means for producing the image.

54.   A system comprising:

means for simulating a radiation treatment plan;

a source of x-ray radiation; and

a flat panel detector for detecting the x-ray radiation.

55.   A radiation simulation system comprising:

a gantry having a radiation source;

a patient support;

a radiation detector;

a computer workstation for controlling simulation of a radiation treatment plan; and

a generator for providing power to the radiation source, wherein the workstation controls

the generator.

56.   A radiation simulation system comprising:

a gantry having a radiation source;

a patient support; and

a radiation detector;

      wherein said radiation source is at a fixed position relative to the gantry.

57.   The system as described in claim 56, further comprising means to move the patient

support as the gantry rotates to maintain a constant distance between the radiation source and a

defined point in space.

58.   A radiation simulation system comprising:

a gantry having a radiation source;

a patient support; and

a radiation detector;

wherein the gantry is a cast gantry, the gantry, the patient support, and the radiation detector being electronically coupled.

59.   The radiation simulation system of claim 58, wherein the gantry is an aluminum cast gantry.